NEWFOUNDLAND REGION GROUNDFISH OVERVIEW

Background

In Newfoundland, Science Branch of the Department of Fisheries and Oceans is responsible, either directly or indirectly, for advising on the status of numerous groundfish stocks extending from Davis Strait between Baffin Island and Greenland in the north to off the south coast of Newfoundland in the south.

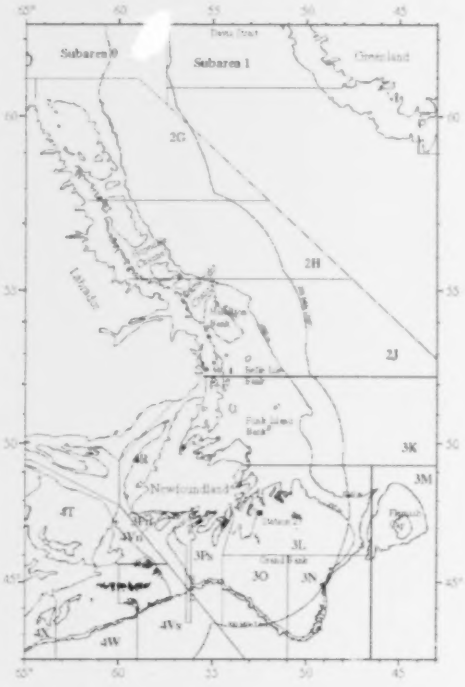
In this area, there are 5 cod stocks (2GH, 2J3KL, 3M, 3NO and 3Ps), 5 redfish stocks (SA2+3K, 3LN, 3M, 3O and Unit 2), 4 American plaice stocks (SA2+3K, 3LNO, 3M and 3Ps), 3 witch flounder stocks (2J3KL, 3NO and 3Ps), 2 Greenland halibut management areas (SA0+1 and SA2+3KLMN), 2 haddock stocks (3LNO and 3Ps), 1 yellowtail flounder stock (3LNO), 1 pollock stock (3Ps), 2 roundnose grenadier stocks (SA0+1 and SA2+3) as well as a portion of the 3NOPs4VWX Atlantic halibut stock. In addition, there is a fishery for lumpfish, as well as relatively new fisheries for monkfish and skates. These latter two came under quota management for the first time in 1995.

Scientific information on the above stocks is provided either through the DFO Science Branch regional review process and the FRCC, or the Scientific Council of NAFO. Quotas are set by the NAFO Fisheries Commission for 3NO and 3M cod, 3LN and 3M redfish, 3LNO and 3M American plaice, 3LNO yellowtail flounder, 3NO witch flounder, SA2+3 roundnose grenadier and SA2+3KLMN Greenland halibut. The NAFO Scientific Council also reviews the Canadian assessment of 2J3KL cod on an annual basis. Greenland halibut and roundnose grenadier in SA0+1 are managed bilaterally by Denmark, on behalf of Greenland, and Canada. Quotas for the other stocks are set by the Minister of the Department of Fisheries and Oceans based on recommendations of the FRCC.

The FRCC makes recommendations to the Minister on all groundfish stocks, advising either on catch levels, or recommending a Canadian position to be taken during NAFO Fisheries Commission meetings.

The Newfoundland Region Stock Status Reports contain information only for those stocks for which the FRCC provides direct catch recommendations to the Minister. Information on the stocks evaluated and managed by NAFO is contained in separate documentation; the reports of the NAFO Scientific Council.

Detailed technical information on each of the stock assessments can be found in the research documents listed with each stock report. Technical information for the NAFO stocks is available through the NAFO SCR Document series.



The Groundfish Fisheries

Cod has traditionally dominated catches in Newfoundland waters, but with the decline in this traditional resource, catches of other species exceeded those of cod in recent years. Significant reductions in catches of a

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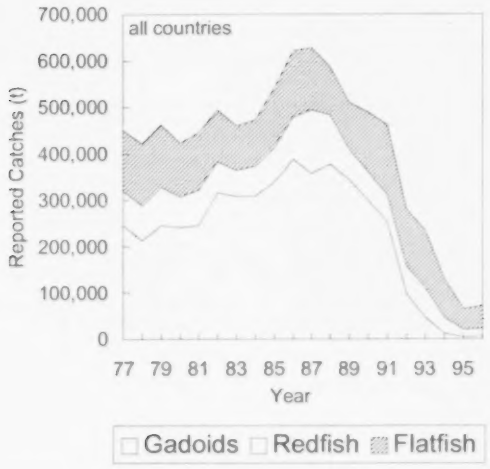


number of different species and stocks occurred in 1995 as a result of reduced fishing effort in the NAFO regulatory area. Inside 200 miles, groundfish catches were once again dominated by Unit 2 redfish in 1996.

In 1996, the only directed fisheries on 'traditional' species were for Greenland halibut in SA0+1 and SA2+3KLMN; cod in 3M; redfish in 3LN, 3M, 3O and Unit 2; American plaice in 3M; and witch flounder in 3Ps. Fisheries for 'nontraditional' species such as lumpfish, monkfish, wolffish, white hake, "black back" (winter) flounder and skates are also taking place.

Background to Groundfish Reviews

This overview provides an update on the status of **SA2+3K** and **3Ps American plaice**, **2GH cod**, **SA2+3K redfish**, **3LNO** and **3Ps haddock**, **3Ps pollock**, **3Ps witch**, as well as **winter** or **blackback flounder**, **skate**, **wolffish** or **catfish**, **white hake** and **monkfish**. These stocks have not been formally assessed this year but their status has been updated by the responsible assessment scientists.

Cod in **2J3KL** and **3Ps** will be assessed during a zonal assessment meeting in early 1998.

Division 3O redfish and **Unit 2 redfish** will be reviewed in detail during September. This change in the timing of the assessment first occurred during 1995, and was made so the redfish in units 1, 2 and 3 as well as Div. 3O could be reviewed together, and results of the summer surveys could be incorporated.

Information on the status of stocks assessed by NAFO, as well as the advice of Scientific Council, is available in the report of the June, 1997 meeting (NAFO SCS Doc. 97/14).

Offshore Research Surveys

The Newfoundland Region has routinely had available two trawling research vessels for offshore studies: the *Gadus Atlantica* and *Wilfred Templeman*. An Engel 145 High Lift otter trawl was routinely used on both of these ships. In 1995, the *Gadus* was replaced by the new vessel *Teleost*.

Because of a desire to collect more reliable information on juvenile fish, as well as information on other species such as crab and shrimp, it was decided to change the research trawl used for the offshore surveys at the same time as the vessel change. The gear now used by both the *Teleost* and *Templeman* is the Campelen 1800 shrimp trawl with 'rock-hopper' foot gear.

Different fishing gear will catch different sizes and quantities of fish species. Concurrent with the gear change, there was also a reduction in the duration of the standard tow from 30 minutes to 15 minutes.

Therefore, before being able to relate catches from surveys using the new survey trawl and tow duration to those made in the past using the old survey trawl and 30 minute tow duration, it was necessary to conduct **comparative fishing experiments**. That is, fishing both nets in the same area at the same time and then comparing catches. In addition, because different vessels have different fishing powers, it is necessary to conduct these net comparison studies for both the *Gadus /Teleost*, and *Templeman* (Engel)/*Templeman* (Campelen). These experiments were described in some detail in last year's overview (Anon. 1996).

Conversion factors are now available and will be applied to the research vessel data before the next assessment of the various stocks.

Groundfish Resource Status

The **'traditional' groundfish resources** in the waters around Newfoundland continue to be at or very near historical low levels. For **Canadian managed stocks** with TACs still in place, reduced TACs were imposed for 1995, and further reductions occurred for 1996. For example, the quota for Unit 2 redfish was reduced from 25,000 metric tons in 1994 through 14,000 metric tons in 1995 to only 10,000 metric tons in 1996.

For the **NAFO-managed resources** excluding those of Flemish Cap, directed fisheries remain open only for Greenland halibut and 3LN redfish in 1996.

SA2+3K American plaice

Catch from this stock was only 15 tons in 1996. Research vessel surveys continue to show that the stock is at a very low level. In Div. 2J and 3K combined, the biomass index declined by over 95% between 1982-83 and 1992-94. The 1995 and 1996 surveys were conducted with the new trawl gear, known to have a much higher catchability of small American plaice. Therefore the survey biomass indices in Div. 2J and Div. 3K for 1995 and 1996 are not directly comparable with previous values. However, even with this change in survey gear, the 2J3K biomass estimates in 1995 and 1996 are only about 10 - 15% of the peak values seen in 1982-83.

Surveys in Div. 2GH in 1996 indicate very low biomass estimates of American plaice in these areas, at about 10% of the 1996 level in Div. 2J3K combined. Given the current stock size estimates from the surveys, there can be no optimism about recovery of this stock in the short or medium term.

SA2+3K redfish

There has not been constant directed effort on this stock since 1990 when 2,400 metric tons were landed. Landings declined to 280 metric tons in 1991 and have been 15 metric tons or less in each year from 1992 to 1996. Estimates of discarded redfish, taken as bycatch in shrimp fisheries, declined from 386 metric tons in 1992 to 110 tons in 1994. Estimates from the 1995 and 1996 shrimp fisheries have not been compiled to date.

Results from research vessel surveys in Div. 2J and 3K suggest the resource was at an historically low level in 1994. The 1995 and 1996 survey estimates cannot at this time be compared directly with the historical series because of the change in survey gear, vessel, and duration of standard tow. There was an increase in the biomass estimate in 1996 compared to 1995, however, given that the new trawl and procedure has resulted overall in a higher catchability than before for fish less than 20 cm, the estimates for 1995 and 1996 are still relatively low compared to the mid

1980s. The research catch is dominated by fish within the range of 20 to 25 cm.

This stock remains at a low level. Recruitment has been very poor since the year classes of the early 1970s. There have been no indications that the status of the stock will change in a positive way in the forseeable future.

2GH cod

There has been no catch reported from the area since 1991. In September of 1996 Canada conducted its first survey since 1991. Survey coverage in Div. 2G was reduced because of time spent on search and rescue. This resulted in strata greater than 300 meters (160 fathoms) being sampled only in the extreme northern part of the Division. Survey coverage in Div. 2H was more extensive covering depths to 1500 meters (820 fathoms). Estimates of abundance and biomass show that both are very low. Aging has not been completed but frequencies show no large fish. The only significant catches of cod in Div. 2G took place in the 300-400 meter (160-220 fathom) depth range and to a lesser extent in the 400-500 meter (220-270 fathom) depth range in Div. 2H. This would indicate that the reduced coverage in Div. 2G may have resulted in a low estimate of biomass.

In August 1996 a survey was conducted by Japan in Div. 2GH targeting Greenland halibut. This survey was conducted with the cooperation of Canada and covered depths from 200-1500 meters (100-820 fathnoms). The survey used a different trawl than the Canadian survey and is not directly comparable, nonetheless the biomass estimate was very low.

Both the Canadian and Japanese surveys may have been more appropriately timed for Greenland halibut than cod. Without a survey or fishery in the inshore portion of the area it is not known if concentrations of cod existed shoreward of the surveyed area.

3LNO haddock

The provisional catches for 1995 and 1996 were only 22 and 69 metric tons respectively. These are the lowest catches on record, and are partially due to the moratoria on cod and flatfish stocks in the Div. 3LNO area first imposed in 1994 by NAFO, and reduced haddock quotas reserved for bycatch.

The relative biomass index was low throughout the 1970s, highest in 1984, declined sharply in 1985, then showed a gradual increase to 1988. The increases were due to growth of the relatively strong 1980 and 1981 year classes. In 1994 and 1995 the index was low with estimates being similar to those of the 1970s. The survey index increased sharply in 1997 compared to 1996. **But, it should be noted that this increase is due to one large catch of large prespawning fish (97% of the abundance and 98% of the biomass) . No juvenile haddock were caught during the 1997 survey.** This stock will not begin to recover unless there is good recruitment.

3Ps witch

This fishery remains open with a small 500 t TAC. Catch has been less than the TAC in the last 3 years and in 1996, 256 t were taken.

The survey biomass index has been highly variable over the time series, fluctuating with little in the way of trends. The survey biomass index was below average but relatively stable from 1993 to 1995 and within the range of previous estimates. There is no indication of a decline between

1996 and 1997. Continued low catches are not likely to cause a decline in this stock.

3Ps American plaice

Research vessel survey information shows that this stock is at a very low level. The 1995 survey biomass estimate was only 10% of those in the mid-1980's. The surveys in 1996 and 1997 conducted using the Campelen trawl, also gave very low biomass estimates. The outlook for this stock is very pessimistic, given the current low stock size, and the lack of recruitment indicated by the surveys. In the short to medium term, there is no prospect for stock rebuilding. Any fishery in 1998 could be deterimental to the stock.

3Ps haddock

Catches of haddock in NAFO Subdivision 3Ps since 1960 have been mainly in the 1,000 to 2,000 metric tons range, increasing to 7,500 metric tons in 1985 then falling below 1,000 metric tons after 1990. The preliminary estimate of catch in 1996 is 141 tons. The increase in the mid-1980s was a result of a relatively strong 1981 year class and increased effort by France. A moratorium on cod established by Canada in 1993 and small bycatch quotas have resulted in decreased catch.

Research vessel surveys have been conducted by Canada since 1972. The trawl indices of haddock from these surveys were low from 1972 to 1982, peaked in 1985 due to the presence of the relatively strong 1981 year class, but then declined again to low levels. The 1996 survey found very few haddock and the 1997 survey found even less. There have been no reports of bycatch in the 1997 cod fishery.

3Ps pollock

Reported landings of pollock increased to 439 tons in 1996 over four times the bycatch quota. Large catches of commercial size pollock resulted in a number of fisheries being closed. Sampling of these bycatches is difficult to coordinate and therefore little information on size structure of removals is available.

The pelagic nature of pollock has always led to questions as to whether research vessel surveys give a reliable index of abundance or biomass. However surveys have been conducted in NAFO Subdiv. 3Ps since 1972 by Canada. The relative biomass index was low in the 1970s. It gradually increased until 1989, but has since declined to pre-1980 levels. Estimates have been low in the 1990's and very few pollock were caught during the 1996 or 1997 surveys. Large pollock evident in the 1996 fishery were not evident in the 1996 or 1997 surveys.

Pollock have never been a major component of the commercial fishery in NAFO Subdiv. 3Ps. The fishery is opportunistic, and based on the occurrence and survival of year-classes against great odds in the extreme north of their range. There may also be occasional migration to the area from further south.

Skates in Divisions 3L, 3N, 3O and 3Ps

Catches of skate increased dramatically in the early 1990's as a result of increased foreign effort outside of the 200 mile limit. Canadian catches increased in the mid 1990's. Total catch in 1996 was 6,800 t, similar to the 7,100 t taken in 1995 but down from 11,800 t in 1994.

Survey estimates show a decrease in all Divisions in 1996 compared to 1995, particularly in Div. 3N and 3O.

Catfish (Wolffish) in Divisions 2J, 3K, 3L, 3N, 3O and 3Ps
Historically, catfish have mainly been taken as bycatch in other fisheries. During the 1980's catches exceeded 10,000 t in most years. They declined after 1991 when many fisheries were closed. In 1996, catches reached their lowest level when only 16 tons were taken.

For spotted wolfish, comparing 1995 with 1996, the biomass index remains at a low level with some divisions showing a further decrease. For striped wolfish, the biomass index also remains at a relatively low level in 1996 but with increases in Divisions 2J, 3K, 3N and 3Ps.

White Hake in Divisions 3L, 3N, 3O and 3Ps
Catches of white hake have declined from a high of 1,505 t in 1992 to 491 t in 1995 and 237 t in 1996.

The biomass index for this species remains at a low level, decreasing in Div. 3O but with an increase in Div. 3P in 1996.

Winter (Blackback) flounder in Divisions 3K, 3L and 3Ps
Blackback flounder is rarely observed in research vessel catches as it is generally restricted to less than 60 m water depth. Thus, lack of data make it impossible to determine trends in biomass or examine other biological characteristics. However, the reported landings suggest that it is widespread along the coast. Catches increased in 1994 and 1995 to 1,670 t and 1,122 t respectively, but declined in 1996 to 537 t, similar to levels observed in the late 1980's and early 1990's.

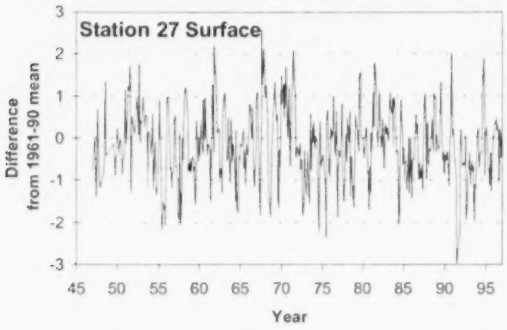
Monkfish in Divisions 3L, 3N, 3O and 3Ps
In 1991 a directed trawl fishery for monkfish began, and almost 400 t were taken. Catches gradually increased with the development of this fishery, to about 1,000 t in 1994. The 1995 catch fell to only 171 t under a quota restriction of 200 t. The 1996 fishery closed early when 219 tons were taken, slightly exceeding the quota of 200 t.

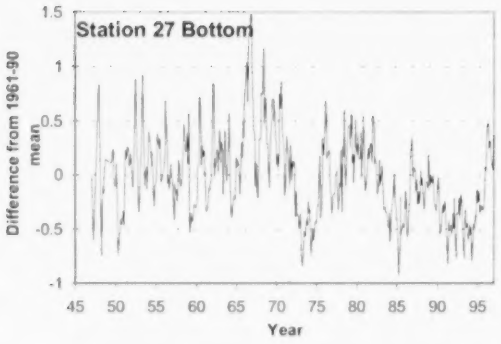
The biomass index remains at a low level in 1996, similar to 1995 levels.

The Environment

Colder than normal air temperatures were experienced over the Labrador Sea and Newfoundland in January of 1996 but had warmed to above normal by February and was average or above for the remainder of the year. The above normal ice coverage along the east coast of Newfoundland and Labrador that was a feature of the early 1990's was not evident in 1996 which had lighter than normal ice conditions.

At Station 27 off St. John's, temperatures over all depths were near normal or above normal. The only exceptions were in July when surface temperatures were 1.0°C below normal and in the autumn when temperatures were slighlty below average in the upper layer. From 75 m to the bottom, temperatures were above average throughout the year.





The area of the cold intermediate layer (CIL) on the Newfoundland shelf was slightly below normal along the Flemish Cap line, and 10% and 12% below normal along the Bonavista line and the Seal Island transects respectively.

Overall, during both summer and fall, the estimated volume of the CIL increased slightly in 1996 but was still below average, indicating less cold water across the shelf.

Off the south coast, the relatively cold conditions which began around the mid-1980s have moderated somewhat, but below normal bottom temperatures continued through 1996.

Outlook

Overall, for stocks examined in this overview, there are no signs of recovery in stock size. Many of the species are long lived and will require a number of years following the next good year classes before recruitment would begin to contribute to the spawning stock biomass. Witch flounder in 3Ps appears to be stable at the current catch level.

For More Information

Research Documents:

Colbourne, E. 1997. Oceanographic conditions in the Newfoundland region during 1996 with comparisons to the 1961-1990 average. DFO Atl. Fish. Res. Doc. 97/4.

Drinkwater, K.F., E. Colbourne and D. Gilbert. 1997. Overview of environmental conditions in the northwest Atlantic in 1996. NAFO SCR Doc. 97/63.

Warren, W.G. 1996. Report on the comparative fishing trial between the *Gadus Atlantica* and *Teleost*. NAFO SCR Doc. 96/28.

Warren, W., W. Brodie, D. Stansbury, S. Walsh, J. Morgan and D. Orr. 1997. Analysis of the 1996 comparative fishing trial between the *Alfred Needler* with the Engel 145 trawl and the *Wilfred Templeman* with the Campelen 1800 trawl. NAFO SCR Doc. 97/68.

Reports:

Anon. 1996. Newfoundland Region Overview. DFO Science Stock Status Report 96/43E.

Anon. 1996. Divisions 2GH cod. DFO Science Stock Status Report 96/44E.

Anon. 1996. Divisions 3LNO haddock. DFO Science Stock Status Report 96/46E.

Anon. 1996. Subarea 2+3K redfish. DFO Science Stock Status Report 96/47E.

Anon. 1996. Subarea 2+3K American plaice. DFO Science Stock Status Report 96/48E.

Anon. 1996. Subdivision 3Ps haddock. DFO Science Stock Status Report 96/82E.

Anon. 1996. Subdivision 3Ps pollock. DFO Science Stock Status Report 96/83E.

Anon. 1996. Subdivision 3Ps American plaice. DFO Science Stock Status Report 96/84E.

Anon. 1996. Subdivision 3Ps witch flounder. DFO Science Stock Status Report 96/85E.

Anon. 1996. Divisions 3L, 3N, 3O and 3Ps skates. DFO Science Stock Status Report 96/86E.

Anon. 1996. Monkfish in Divisions 3L, 3N, 3O and 3Ps. DFO Science Stock Status Report 96/89E.

Anon. 1996. White hake in Divisions 3L, 3N, 3O and 3Ps. DFO Science Stock Status Report 96/90E.

Anon. 1996. Catfish (wolffish) in Divisions 2J, 3K, 3L, 3N, 3O and 3Ps. DFO Science Stock Status Report 96/91E.

Anon. 1996. Blackback (winter) flounder in Divisions 3K, 3L and 3Ps. DFO Science Stock Status Report 96/92E.

Anon. 1997. Report of Scientific Council 4-19 June 1997. NAFO SCS Doc. 97/14.

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